

JOURNAL OF CALENDAR REFORM

EDITORS

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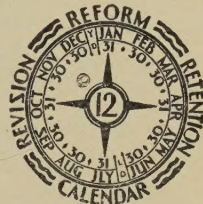
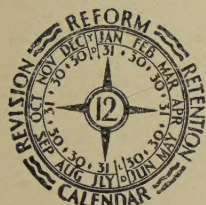
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LET'S STUDY THE PROBLEM

By A. HARRY MOORE

Governor of New Jersey

From the Governor of a great Commonwealth, who is one of the leading figures in his party in a year of great political potentialities, comes this significant pronouncement on the importance of calendar reform. Governor Moore insists that calendar reform be kept out of politics but at the same time he recommends that the national government inaugurate an official study of the question. Initiative in the next step toward international consideration, he urges, may very properly come from the United States. Governor Moore is a lawyer who has been a leader in the civic affairs of his state since 1908. He is now serving his second term as Governor.

UNTIL very recently there was an almost justified tendency on the part of the general public to steer clear of a discussion of calendar reform as something Utopian. During the past year this attitude has changed considerably. Proposals for calendar simplification have been brought forward which are practical, logical and free from the radical objections associated with earlier plans. These proposals are being internationally discussed, and the acceptance of some modification of our present calendar in the reasonably near future looms as a distinct possibility.

The dire results of the business depression have made everybody willing to give serious consideration to projects that may have seemed Utopian a few years ago. Any measure that will make for efficiency deserves ex-

amination. If the defects of our present calendar are operating to hamper and injure economic activity, now is the time to think about change.

Some of the inconveniences of the calendar are obvious to anyone who has had experience in the courts, in legislation, or in government. Because month dates and weekdays fail to synchronize, lawyers and legislators are forced continually to resort to such awkward circumlocutions as "the first Monday after the second Saturday," and "or if said day be a legal holiday then on the next succeeding day not a holiday." The courts are frequently occupied with law suits arising out of calendar errors or misunderstandings, usually due to the fact that the anniversary of an event seldom falls on the same day of the week as the event itself.

The unequal length of months and quarters introduces a continuous element of difficulty into statistics, on which many of our business and governmental activities are increasingly dependent. There is no standard month, no standard quarter, no standard half-year. A month may be 28, 29, 30, or 31 days. A quarter may be 90, 91, or 92 days. These differences are important today, when percentages rather than numerical differences are our bases for statistical comparison. There is a difference of 11 per cent between the length of February and the length of March. There is an even greater difference between the number of working days, which is a vital statistical factor in industry. All calculations of salaries, interest, insurance and leases, which are fixed on a monthly, quarterly or half-yearly basis, are inaccurate and do not correspond with one-twelfth, one-quarter or one-half of the year.

Thus calendar irregularities crop up in finance, banking, accounting, shipping, insurance, investment, labor, production, real estate, and many other activities. Even though we have become accustomed to these inconveniences, they nevertheless exist and exact their price in time and energy. Modern life is bound to the wheel of time, and all of us are tied to inexorable schedules.

The present era places great emphasis on precision. We have developed methods of time measurement that can split the second into a hundred billion parts. At the little end of our time-measuring problems we have arrived so close to perfection that the difference is a matter for Einstein to deal with. But at the other end of time measurement we are still using an arrangement of weeks, months and years that was devised in an age when scientific accuracy had not even been imagined.

There are those perhaps who oppose any change in the calendar, merely because it is 2000 years old. That, I think, is not quite a good reason for closing our eyes to all possibility of improvement, although it may be a consideration which has a bearing on the advisability of making any changes as moderate as possible. The present calendar has behind it the authority of a tradition of twenty centuries, and during that time it has

been inseparably bound to the habits of all civilized men: therefore we should restrict our projects of reform to the most essential points and to modifications which are incontestably important. We must be practical, seeking not abstract perfection of uniformity, but greater convenience and utility.

We need not contemplate any headlong rush into a simplified calendar. Revision is an international question, with which no nation can deal single-handedly and alone. Before anything definite can actually be put into effect, there must be a meeting of the minds of many different peoples and governments.

The initiative, however, may very properly come from the United States, as it did 50 years ago in the worldwide adoption of Standard Time. I see no reason why our national government should not inaugurate a study of the question, so that the whole discussion of it in the United States will be on a formal and official basis. Such a study ought to be without prejudice or commitment. But the widespread interest of other civilized governments in this subject makes it unwise for us to leave the interpretation of American opinion solely to private and unofficial propaganda committees, whose activities are likely to be misunderstood abroad.

Calendar reform is not a political question. If any attempt is made to put it into party politics, the attempt should be scotched. For it is a question wholly of scientific, industrial and human efficiency and comfort, which becomes an absurdity if treated on a basis of partisan advantage. It is a question of a fundamental and desirable simplification in everyday life.

Obviously we shall do well to seek a method of calendar reform which is as moderate as possible, so that it can be put into effect without serious inconvenience to anyone. The inequality of the months and quarters can be remedied with very slight changes. The need for making the calendar perpetual, so that a given day of the month always falls on the same weekday, should be similarly met with a proposal which promises the least possible disturbance of present customs and habits. The proposed revision, in short, should be based on the principle of making the fewest and simplest changes that will eliminate the admitted inaccuracies and maladjustments of the present calendar.

Sane and practical revision of the calendar is undoubtedly desirable. Standardization in the use of time has become important, and if the calendar can be placed on a sounder economic basis, this will make for savings in convenience, expense and friction which should be reflected in better and less wasteful management, alike in the home, in business and in government.

TWELVE MONTHS BEST

By H. R. KINGSTON

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Retiring President of the Royal Astronomical Society of Canada*

At the annual meetings of the Royal Astronomical Society of Canada, the chief feature is the formal address of the retiring president, reviewing the progress of astronomical science during the previous year. In Professor Kingston's address this year, considerable space was devoted to the progress of calendar reform, which is naturally of great interest to astronomers. The retiring president predicted the early adoption of a simplified calendar, in response to a growing public demand for a more uniform distribution of time than the present calendar provides. The part of his address which dealt with calendar reform is printed below.

WE SHOULD not close this review of the progress of astronomy in 1931 without mentioning a development of the past year which is, or will soon become, of great and very general interest. I refer to the progress that has been made toward the adoption of a new calendar.

The increased interest that is being shown in calendar reform as the public learns more of the advantages and simplicity to be gained, makes the adoption of some new scheme at a fairly early date, almost certain.

At the present time, we are probably nearing the end of the third stage of calendar history. With agriculture giving place to manufacturing as the principal industry in many countries of the world, with the consequent employment of vast numbers of persons in single industries and with the increasing complexity and competition of industrial life, it is becoming more and more necessary in cost accounting to equalize the number of working days in the months, in the quarters and in the half-years. Also, it seems desirable, if not absolutely essential in our ordinary life that the lengths of the months be more regular and that the calendar be "perpetual," that is, that the years all begin on the same day of the week and also that any particular date always fall on the same day of the week.

Before the time of Julius Cæsar, a lunar calendar was used, the moon's period of $29\frac{1}{2}$ days from new moon to new moon being the unit. Twelve "moonths" or months of alternately 29 and 30 days constituted a very crude approximation to the year. The extra 11 or 12 days necessary to complete the year were taken into the reckoning by intercalating a month or sometimes two or more months as suited the political whims of those in control. This resulted, of course, in great confusion.

The first stage of calendar development ends with Julius Cæsar, who, on the advice of the Alexandrian Astronomer, Sosigenes, inaugurated, in 45 B. C., the second stage in calendar evolution, a stage in which the moon

played no part at all. The months contained, under the new arrangement, 30 or 31 days, with the exception of February, from which one day was taken and added to July to honor Julius. This calendar year was now 365 days long, and an extra day was added each fourth year to make the average length of the year $365\frac{1}{4}$ days. To keep up with Uncle Julius, Cæsar Augustus took another day from February and added it to August, leaving February 28 days except in leap year when it had 29.

This second stage lasted until 1582, when Pope Gregory XIII brought the calendar, which had by that time fallen eleven days behind the sun, up to date by skipping eleven days and changing the leap year rule by dropping the counting as leap years of those even century years not exactly divisible by 400. Thus the third stage begins, and the calendar will now keep step with the sun to within one day in 3,300 years. This Gregorian Calendar was not adopted by England till 170 years later.

For the fourth stage, a great many new calendars have been suggested during the past few years, but up to a year or two ago, a thirteen-month year with 28 days in each month, was the one which seemed to have the largest following. This was sponsored by a Canadian, Mr. Cotsworth. In his calendar each month contained exactly four weeks, the thirteen months thus making 364 days. To make the calendar perpetual, the 365th day was to be a universal holiday and not count as any week-day. This day was to be added after December 28. In leap year, another such day would be introduced, probably near the middle of the year. The fact that 13 is not integrally divisible into halves or quarters (or thirds for Spanish speaking countries) militates very strongly against the adoption of such a scheme.

The matter came before the League of Nations and was referred to the various governments for recommendations, which were presented to the League in October, 1931. During the past year or more, a great deal of opposition to the 13-month arrangement crystallized because of the difficulty mentioned above, also because of the increased labor and cost in preparing 13 monthly business statements each year instead of 12, and because of the fact that many dates would be considerably changed, those near the middle of the present calendar year being shifted by half a month; thus the 30th of June by the present calendar would be about the 15th of Sol by the 13-month calendar, Sol being a new month added between June and July. There were also several other objections, not overlooking, of course, the widespread feeling or superstition about the number 13 itself.

Another suggestion for a new calendar was sponsored in Continental Europe by the Swiss government, in England by a Parliamentary committee and in America by The World Calendar Association. According to this plan the year would retain 12 months of four identical quarters, each quarter having 3 months of 31, 30 and 30 days respectively. January 1st would come on Sunday, February would start on Wednesday and March

would begin on Friday and end on Saturday. Then April, May and June would merely repeat January, February and March, and likewise the two quarters, July, August, September, and October, November, December. This would take care of 364 days. The 365th day would be an international holiday following December 30th and would not have any week-day name. Similarly in a leap year, an extra holiday—not to count as any week-day—would be put in, probably after June 30th.

This calendar is very simple. It retains that most desirable number of months, namely 12; it is perpetual; every month has exactly 26 working days; the quarters are exactly equal; the half-years, likewise; and, moreover, no dates in the present calendar would be shifted more than one or two days either way by the introduction of this plan. This calendar could be introduced in 1933 or 1939 without any disturbance of week-days, since those years begin on Sunday.

When the matter came before the League of Nations, in October last, it was found that only two delegates had been specifically instructed by their Governments to support the 13-month plan. These countries were Canada and Yugoslavia. In very few cases were the delegates actually instructed by their governments to support any particular scheme, but the reports indicated a strong opposition to the 13-month plan and a general sympathy for some 12-month arrangement.

No particular plan was actually sponsored by the League, as it was felt that the public was not yet sufficiently acquainted with the various plans to judge their values accurately. Hence, the matter was referred back again to the various governments. The meeting of the League did, however, serve to stimulate interest in the problem and to disseminate a great deal of information regarding the reformed calendar.

The League voted to support the stabilization of Easter, that is, placing it on a definite Sunday, as, for example, the first Sunday after the second Saturday in April. This question has been considered by the great religious bodies of the world, and altogether, the stabilizing of Easter has been very generally approved. It is a matter which is quite independent of any general calendar reform, but, unless a perpetual calendar is adopted, the date of Easter Sunday would still wander over seven days. In this connection it should be noted that England has already passed an act by which she will put the new Easter into effect as soon as it is adopted by other nations. Similar action by England or any other leading nation in regard to a 12-month calendar plan such as the one described above would be a very effective forward step in calendar reform.

It is felt that public opinion will not be ripe for any change in 1933, and hence, if the "World Calendar," as it is called, is to be adopted, its inauguration will have to be delayed till 1939.

SO THIS IS LEAP YEAR

By JOHN ARMSTRONG, LITT. D.

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FACT and fable are strangely mingled in the history of Leap Year. What would seem to be fable is revealed as founded on fact, and what has long been accepted as fact is often discovered to have historical basis as slender as the estimable nursery tale of George Washington and his father's cherry tree.

For an illustration of a Leap Year legend that would ordinarily be dismissed as pure fancy, take the traditional privilege of the fair sex to propose marriage during leap year. It will surprise most of us to find that this privilege is based on actual legislation, enacted into law by Scotland nearly 650 years ago, in 1288. Here is the wording of the Scotch law:

"It is statut and ordaint that during the rein of hir maist blissit Megeste, for ilk yeare knowne as lepe yeare, ilk mayden ladye of bothe highe and lowe estait shall hae liberte to bespeke ye man she likes."

As an illustration of accepted leap year history which is actually based on fable, there is a long series of tributes which calendar historians have paid to Julius Caesar and his staff of professorial experts, as the founders of Leap Year and as mathematical geniuses whose intercalated day was so ingeniously figured, so accurate and precise, that it required no corrective legislation until the time of Pope Gregory. But Leap Year, in exactly the form which Caesar enacted, was nearly 200 years old when he took it over from the Egyptians. The installation of it in the new Roman calendar required no more mathematical genius than that used by a modern child in transferring from one trolley car to another with the assistance of a punched transfer ticket.

The facts of the origin of Leap Year are on record in the 7-foot chiseled surface of the Tanis or Canopus Stone, a cast of which may be seen in the National Museum at Washington. This stone was discovered by Karl Lepsius, the celebrated Orientalist, at Tanis, Egypt, in 1866. It bears a long inscription in Egyptian and Greek, a decree under date of 238 B.C., establishing Leap Year in Egypt. The decree, freely translated, reads:

"In order that it may happen that the matters decreed to be done at each season of the year may be done in accordance with the position which the heavens have with reference to the things which have to be performed at the present time (so that occasion may not be given and the case may not arise that some of the winter festivals should be observed in the summer, in consequence of the rising of the calendar star Sirius advancing one day every four years); and on the other hand, in order that some of the

summer festivals shall not in the future come to be celebrated in the winter (a thing which has actually happened in the past and would happen again if the year always consisted of 360 days and 5 additional days, according to the current practice) :

"It is commanded that from this time onward, one day—a festival of the good-doing gods—shall be added every four years, so that every man shall know that the small amount of time which was lacking in the arrangement of the seasons and of the year and in the rules which passed as laws for the knowledge of their movements, has been corrected, and that this correction has been supplied by the good-doing gods."

This was precisely the Leap Year which was brought from Egypt to Rome by Sosigenes, the Alexandrian astronomer whom Caesar commissioned to draft the new calendar.

But it was so much of a novelty, and so poorly understood by the Roman authorities, that for a generation they mistakenly made every third year a leap year instead of every fourth. This continued until there had been twelve leap years when there should have been but nine, and to make the correction, Emperor Augustus ordered omission of leap day for 12 years.

The Roman mistake is naively explained in some detail by Macrobius. Caesar's order, he says, was "that every fourth year should be a leap year." But it was the Roman custom, in counting from one event to another in a series of years, to include the year at the beginning as well as the one at the end of the series. Therefore the order to add a leap year every fourth year was interpreted to mean what in Sosigenes' Egyptian reckoning would have been expressed by "every third year." The whole performance seems, as one of my students expresses it, "a bit dumb," but perhaps that is because our own Anglo-Saxon way of counting is like the Egyptian rather than like the Roman. I may say, parenthetically, that there is some reason to suspect the pontiffs, who were the principal priests of the state religion of pagan Rome, of having been intentionally "dumb," in the fashion of some modern politicians, for reasons of intrigue or personal advantage—but that is another story, much too complicated and involved to be argued out at this time.

At any rate, Augustus, who had occasional moments of high and lofty purpose, ordered the correct Leap Year rule cut on a tablet of brass, so that it might be observed properly forever afterward. Perhaps he also had notations made on the calendars of stone which he placed at the cross roads everywhere through his Empire, to inform the farmers of the time to shear their sheep and pick their grapes, as well as to remind them of their manifold religious duties.

Why is leap year in the present calendar inserted in February? Here, again, we are on debatable historical ground, with fact and fancy mingled to form a bewildering pattern. Leap day is still called "bissextile," or

twice sixth, because the Roman custom was to count twice the sixth day before the calends or first day of March. Nobody knows whether the inserted leap day was considered as the one immediately after the 23d of February, or the second one after the 23d. Romans always numbered the days as so many days preceding some date in the future, instead of so many days after a date in the past, which is our modern custom.

A whole series of historical debates might easily be staged over the legends of the intercalary month of Mercedonius. It is vouched for in many histories, but contemporary Roman writings are ignorant of it.

There is no agreement among historians as to which were the leap years in the first half century of the Julian calendar. Some hold that 45 B.C. was the first Roman leap year. Others place it in 44 or 42.

Another piece of debatable ground is the question, Why do we call it "leap year"? A number of theories have been proposed. Back in 1704 a learned historical writer explained: "The bissextile year is called by us leap year because one day of the week is leaped over in the observance of religious festivals, by reason of the additional day in that year." Which doesn't really make very good sense. The name is probably a misnomer, like many other English words. For there is no real leap made in the calendar, as there would be if leap year was one day shorter than ordinary years instead of one day longer.

What of Leap Year in the calendar of the future? Calendar revision, in either of the forms agreed upon by the League of Nations after a long process of elimination and combination, will shift leap day from February 29 to the middle of the year.

In the plan supported by Switzerland and many other European countries, and backed from America by the 5,000 members of The World Calendar Association, leap day becomes an extra Saturday between June 30th and July 1st. English speaking countries may call the day June "L." Continental Europe, which knows not the words "leap day" and "leap year," may call it June "B," for bissextile.

This procedure is thoroughly in accord with historical precedent. The Latin word "intercalary" means "called between," and Roman intercalary days were those added by the pontiffs between established points in the calendar for the purpose of adjusting the year to the sun and seasons. After these called-between days had passed, they were regarded as not affecting the reckoning or the dating.

The proposed change would seem to the historian to be one which can be made without seriously inconveniencing anyone. It is a smaller change than most of those which have taken place in the past. As far as the new rule for Leap Day is concerned, I am inclined to agree with Dean Madden of New York University that "in all probability its introduction would be effected almost unnoticed by the world."

FIXING THE EASTER DATE

By CHARLES D. MORRIS

Editor of the Journal of Calendar Reform

In the United States there has recently been considerable discussion of the proposal to fix Easter, and the Federal Council of Churches has officially expressed a "sincere interest in the efforts to secure universal agreement upon a fixed day." In Europe, an inquiry conducted by the League of Nations among religious authorities disclosed that no dogmatic objections were found by the Roman Catholic, Eastern Orthodox or Anglican churches, while the representative of 82 Protestant denominations stated that "no Protestant church would oppose a reform which would serve the good of humanity and most of them would therefore accept fixation of Easter." The collected opinions are thus summarized by the League of Nations: "Most Christian churches have declared themselves disposed to accept stabilization, on condition that the measures are adopted simultaneously. The Holy See has stated that if it can be shown that fixing of Easter would be of universal benefit, it will then submit the question to the next Ecumenical Council."

STABILIZATION of Easter is now in the hands of the churches. At their request, the secular aspects of the question have been passed upon by the League of Nations and by various European governments. Most of the Christian churches have indicated a willingness to accept this long-delayed reform, and the only obstacle to its immediate consideration is the lack of convenient ecclesiastical machinery for carrying out the task.

Agitation for the fixation of Easter is no novelty. In fact, it has been going on for many centuries. It had ardent advocates at the time of Pope Gregory's general reform of the calendar in 1582, and there was an expectation then that the inconvenience of a wandering Easter would be remedied. But fears that this change might complicate the acceptance of the more basic and important legislation for repairing Julius Cæsar's defective leap year rule triumphed against the best judgment of the leaders, and it was decided to accept a half-way measure of reform rather than none. Proposals for completing the task have arisen from time to time ever since, and the movement within the churches for dealing definitely with the Easter question has been particularly active since the Church of England brought the matter into the British Parliament eleven years ago, finally obtaining the passage in 1928 of the British Easter Bill, designating Easter as the Sunday after the second Saturday in April. Endorsement of a fixed Easter, on the secular side, has come from the German Reichstag and from many commercial, industrial and educational bodies.

The question is frequently asked, "Why do European governments and secular bodies interfere in this Easter question, which is religious, not

secular?" The answer, of course, is that the situation is quite different in Europe than in America. Easter over there is a secular holiday as well as a religious one. And in most foreign countries this holiday extends over a period of two, three or even four days, thus vitally affecting industrial, financial, judicial, legislative, educational and social schedules. Of 116 countries, approximately 95 officially observe Good Friday as a holiday, 42 similarly observe Holy Saturday, and 85 observe Easter Monday. On the other hand, in the United States only 9 of the 48 states officially observe Good Friday, and none of them recognize either Holy Saturday or Easter Monday. (The four American possessions, Hawaii, Philippine Islands, Porto Rico and Virgin Islands, all observe Good Friday.)

For many activities abroad, Easter is a more important starting point than New Year's—a situation which has historical justification in the fact that Christian nations long regarded the calendar year as beginning with Easter, an idea which was enacted into law by Constantine. Official reckoning of the year as beginning at Easter lingered in France until 1564. England and America, however, officially observed New Year's on March 25, Annunciation Day, until the calendar reform of 1751, when it was enacted "that the supputation according to which the year of our Lord beginneth on the 25th day of March shall not be made use of from and after the last day of December, 1751, and that the first day of January next following shall be reckoned to be the first day of the year 1752."

The secular place of Easter among the nations of today is thus explained by the League of Nations: "Stabilization is preeminently a religious question, and any solution depends on the free decision of the religious authorities. Nevertheless the present instability disturbs the regularity of commercial and judicial activities as well as school and university studies. The Easter season being almost universally a holiday period, stabilization would offer genuine advantages to the population."

While the American churches will not have the principal voice in the actual enactment of a fixed Easter, their collective opinions could undoubtedly exercise a large influence in stimulating European churches to push the necessary formalities to completion.

The attitude of the Holy See, as communicated to the League of Nations, is that "the stabilization of Easter does not encounter difficulties which can be regarded in advance as insurmountable," and "if it were proved that the general welfare called for changes in the venerable traditions at present followed in determining ecclesiastical feasts, particularly the feast of Easter, the Holy See would only examine the question on the preliminary recommendation of an ecumenical council."

At present we keep Easter on the first Sunday after the first full moon in the Spring. The Spring begins at the vernal equinox, March 21. The earliest possible Easter is therefore March 22, the latest possible is April

25. When it happens that a full moon falls on a Saturday and that Saturday is March 21, then on the very next day Easter is kept on its earliest possible date. When it happens that the full moon falls on a Sunday as late as April 18, we have to wait for the following Sunday, and Easter falls on its latest possible date, April 25.

Thus Easter can vary by 35 days, the length of a whole cycle of the moon, about $29\frac{1}{2}$ days, plus the inside of a week. Owing to the concurrence of several variables and artificial conventions in calculating Easter, there seems to be no regular sequence in its occurrence, at least for those who are not at the same time theologians and astronomers. This year's Easter, March 27, falls on a date which was last observed 11 years ago, and which will not occur again in the present century. The whole eccentric variation is troublesome and disturbing, alike in religious, educational, commercial and civil life.

If Easter is meant to be the anniversary of Christ's resurrection, why did early Christians put it on a movable date? Especially in view of the fact that Christmas is not so, and also that the weekly Sunday was a continually recurring commemoration of the same sacred event?

The first Christians were Jews, and it was easy for them to remember that Christ's resurrection took place on the Sunday after the Passover. It was not easy for them to remember the real calendar date in the solar year, for the Julian calendar had hardly penetrated into the ordinary life of these remote parts of the Roman Empire. The Jews had no solar months and only an approximate way of conforming to the solar year.

In the incredible confusion of calendars in the first century of the Christian era, it was difficult to fix and express a date. If only somebody had set down the exact year "from the founding of the city" of Rome, and the Roman month, and the day's relation to the Ides, Nones or Calends, there would have been no difficulty. But the Jewish Christians stuck to their Jewish chronology. Most of them did not use the Julian calendar at all. Others passed back and forth so often through districts where different eras and calendars prevailed that they found it impossible to remember or express the correct date or year. Many cities, such as Antioch, had their own calendars and eras.

It should be remembered that the sanctity of special times and dates was an idea absent from the minds of the early Christians. The Jewish Christians naturally continued to observe the Jewish festivals, as many of them continued to attend the Synagogue. Thus they carried over into later Christianity the Passover festival with its annoying connection with the full moon. On the other hand, Christmas was fitted into the Julian calendar, and became a fixed feast from the Fourth Century.

Our system of years (A.D. and B.C.) was a matter of comparatively late adoption. When Cæsar enacted the present calendar, years were,

of course, numbered from the founding of the city of Rome. Among the early Christians, ecclesiastical chronologists used to reckon in years of Abraham, his birth being placed about 2016 B.C.

Gradually the supposed date of the birth of Christ replaced that of the founding of Rome, but this system was very slow to win official recognition, despite its convenience. Charlemagne appears to have been the first secular authority to use it.

A few late Roman historians figured all dates from the enactment of the Julian calendar. Ancient Spain had an era all its own, beginning with 38 B.C., a date chosen for no particular reason that is now known.

Meanwhile the ecclesiastical calendar was growing from a twin stem, one side regulated by the sun-year of the Julian system, the other by the moon's phases, adapted from the Hebrew calendar. The dual system still endures. Such days as Christmas, the Feast of the Circumcision and the Nativity of the Blessed Virgin are fixed days, originally set according to the solar calendar. Such days as Easter, Ash Wednesday, Palm Sunday, Ascension and Pentecost are movable feasts, their date being determined by the moon's periods.

As to the date upon which a fixed Easter should fall, the decision rests with the religious authorities. The Resurrection probably took place on April 9. The average date of Easter for the past hundred years has been April 8. This date indeed is particularly appropriate—first, because it closely approximates the generally accepted date of the event which Easter commemorates; second, because it divides the Christian year equally. The Sunday nearest to April 8 would therefore seem to be desirable.

There are certain obvious objections to permitting a stabilized Easter to fall around the 15th of April, for the mid-month is an important business date for the payment of rents, dividends, interest and taxes. The disadvantage of Easter coming on such a date is increased by the fact already mentioned that the Easter holiday in many countries spreads over a period of three to four days and would thus interfere with business appointments and engagements, introducing an alien note into the religious spirit of the holiday.

Those ecclesiastical authorities who are charged with considering the date for a fixed Easter should go carefully into the manner in which their selection will fit into a revised perpetual calendar. Agitation for such an improved calendar is gaining ground steadily throughout the civilized world, and its adoption within the more or less immediate future is regarded as inevitable by most of those who have studied the subject. It is even possible that the churches may feel it advisable to regard the fixation of Easter as an integral part of such a reform and not as a separate question outside it and preliminary to it.

In the proposal known as The World Calendar, supporters of the

project have recommended either April 8 or April 22 for Easter day. The former is nearest to the historical date; the latter might prove more acceptable to certain countries because of climatic conditions.

It is to be hoped that the whole subject will receive a prominent place on the agenda of the world conference of churches which is to be held at Stockholm in 1935, at which all churches, with the possible exception of the Roman Catholic, will be represented. In the meantime the Roman Catholic authorities may have considered the matter and decided on their own program.

EXPLANATION OF SWISS PLAN

SEVERAL readers have asked for a clarification of the term "Swiss Plan," as applied to the proposals for an equal-quarter perpetual calendar.

The present "Swiss Plan," as advocated by the Swiss government at the League of Nations, is identical with that known in America as The World Calendar. Some years ago, however, the term "Swiss Plan" was used to describe a somewhat similar proposal advocated by the great Swiss educator, the late Prof. L. A. Grosclaude. His plan differed from that now urged by Switzerland in that its equal-quarters began on Monday, and the three successive months of each quarter were arranged to contain 30 days, 30 days and 31 days.

The Grosclaude plan has been superseded now by the improved arrangement (31-30-30, with the quarter beginning on Sunday), supported by the Swiss Government, the British Parliamentary Committee, The World Calendar Association and many other organized advocates of a 12-month revision.

DISADVANTAGES OF THIRTEEN

(Popular Astronomy)

SUBSTITUTION of a 13-month calendar for the 12-month one would be attended with very great confusion while the world was trying to adjust itself. A generation at least would pass before it could be universally established. Consider how long it took standard time to be generally adopted. But the difference between adopting standard time and adopting a 13-month calendar would be fairly comparable to the difference between moving the long pointer of the clock a few minutes (which in fact was all there was to do to adopt standard time) and wrecking the clock to build a new one out of its ruins with a thirteen-hour face.

It would create havoc in the financial world, for every bond, every certificate of stock carrying a date for payment must be called in, the plates reengraved, reprinted, individually filled out, signed and returned to the owners—a prodigious task at an appalling cost. The alternative would be the use of two calendars side by side till the certificates were called in and the bonds retired, which might well be a century hence.

All interest tables, wages tables, astronomical tables and all calculations based on the 12-month year must be replaced. The difficulties of computing interest having to work with thirteenths instead of with halves, thirds, quarters, sixths and twelfths must be experienced to be appreciated. Try it. The twelve signs of the zodiac will have to be redistributed, each month covering a fraction of one or two signs.

A great many laws must be revised, adjustments for legal obligations must be made. No generalized law could be devised, for the dislocation of dates from their established position in the year would run all the way from one to fifteen days forward or backward, and an entire new month taken into consideration.

FROM EGYPT AND BABYLON

By ABRAHAM WELLEN

Evidence of the rapidly growing interest in calendar reform in educational circles is to be seen in the recent award by New York University of the degree of Master of Commercial Science to Mr. Wellen for graduate studies during the past year in the "Social and Commercial Phases of Calendar Reform." Mr. Wellen is a certified public accountant living in New York City.

WHERE did calendars originate? Who was responsible for the changes they have undergone? How was our present inaccurate system evolved? Searching to answer these questions, many of us will be surprised to learn that the ancient Egyptians had a more practical calendar than ours, and that we owe certain phases of our unsentimental system—such as our anemic February of only 28 days—to Roman whims and superstitions.

We boast that the aim of our present "machine age" is the conservation of time; machines do more work so that men may enjoy more leisure. Yet our very means of measuring time wastes time. Though our machines are being constantly improved and transformed, our calendar remains a makeshift.

If we could go back to the early days of the human race, we would not find any trace of a system of reckoning time. For that was a comparatively late accomplishment in man's rise to civilized stature. He first had to develop a means of expressing himself, a makeshift language, then a system of numbers, writing and religion. After that, a mechanical means of measuring time.

Time measurement probably came as a corollary of religion, which started with worship of the visible gods of the heavens, the sun and moon. Our nomad ancestors traveled at night by the light of the moon, and this was their supreme god. With the aid of the regularly recurring phases of their god they were able to devise the first system of counting time. Nomads became agriculturists and the importance of the moon was supplanted by devotion to the sun, the god which brought warmth, sunshine and happiness. From the sun came knowledge of seasons, and man learned when to plant crops and when to reap them.

Egypt and Babylon share the honors of inventing our present calendar. As to which had priority there is disagreement among authorities. But we know that the two civilizations were closely interwoven, and the debt of one to the other is often a matter of conjecture.

The Egyptian calendar was inseparably bound up with religion. Its year consisted of 365 days, divided into 12 months of 30 days each and an

annual remainder of 5 days, which were given over to religious sanctifications and ceremonies. The celebration of the New Year came at the beginning of the Nile flood, which was the most significant event in the calendar, bringing new fertility to a land in which agriculture was the paramount occupation.

Historians have often eulogized Egypt's invention of the calendar as a landmark in civilization. And the Egyptians not only invented, but perfected it into an accurate and efficient device for time measurement at a date prior to the year 4241 B.C. James Baikie pauses in his monumental *History of Egypt* to remark: "To the average mind accustomed to the succession of months and weeks and their apportionment on the printed sheet which can never be found when it is wanted, this may seem a feat that is not worth mention. But in reality it involves faculties both of observation and reasoning which are by no means possessed by everybody, even in our own day. The Egyptian calendar, but for one slight fault, was actually a very much more convenient arrangement than our own cumbrous modified (and spoiled) Julian calendar, with its long and short months."

The "one slight fault" in the early Egyptian computations was a failure to add an extra day every four years, which would have made their year approximately correct from the astronomical viewpoint. In consequence of this error, their year shifted by a full day every four years, and so every festival passed right around through the calendar in 1460 years, thus providing a magnificent bone of contention for future students of Egyptian chronology.

But the skill which without instruments reached even so close to the truth, and the reasoning power which built up the perfected calendar on these observations, must have been of a high order.

The Egyptian year was divided into three seasons, called the Inundation, the Sowing and the Harvest. Months were subdivided into three periods of ten days each—perhaps because the most convenient number to count was the number of fingers on both hands. The day was divided into six watches, a division which is perpetuated in the modern system of dividing time on shipboard.

Babylonia's method of time reckoning was both like and unlike that of ancient Egypt. The Babylonian belief was that the gods at the beginning of each year determined the whole course of affairs for the following year. Therefore they observed a ten-day celebration at New Year's to give the gods time to arrange everything properly. The central object of all the feasting, pomp and pageantry was indicated in the name given to the observance—"Fixing of the Destinies."

Calendar knowledge was held and closely guarded by the ruling classes, who relied to a great extent for their power upon this exclusive and im-

portant information. At an early stage in Babylonian civilization we find mathematical calendar tables, together with time measuring instruments such as the water glass and the sun dial, and contrivances which recorded the movements of stars, thereby measuring the hours of night and day. These records developed from astrology into astronomy. Charts of the sky were constructed, showing the path by which the sun traveled across the sky. In this path—the Zodiac—various constellations were marked, named and connected with the various months. The system is still used, with slight modifications.

Early Babylonians gave each year an individual name, usually after a war or other outstanding event. The name was formally conferred on the first of Nisan, when the king celebrated New Year's. Several centuries later a new system for designating the years was introduced, establishing for each reign an indefinite series of years starting with the first year after the succession and ending with the last year of the reign.

Babylonian calendars were essentially lunar. For a long period there was much confusion in reckonings, each town or political subdivision having its own system. Not until the reign of the great Hammurabi was a universal system introduced. This was a 13-month year not very different from that which has been intermittently "discovered" by calendar reformers ever since, except that it was varied at certain proclaimed intervals by an intercalary fourteenth month.

Length of the month was measured by the appearance and return of the new moon, and the natural division of the month of course would be by phases of the moon. From this developed the seven-day week as we have it today. Even the names of week-days come straight down to us, in translation, from the city of the Hanging Gardens, whose scholars assigned to them the names of seven heavenly bodies they regarded as planets—sun, moon, Jupiter, Mercury, Mars, Venus, Saturn.

Our method of subdividing the day and counting the hours also comes from Babylon. Although at first they divided the 24-hour day roughly into six parts, three night watches and three day watches, they later adopted a system of 12 double hours. Thence comes our double 12-hour system of watch or clock recording, and the reason for calling our time-registering mechanism a "watch."

Both the Egyptian and Babylonian calendars were "perpetual," in the sense which modern calendar reformers emphasize so persistently as a present-day need. To the mathematicians of those early days, it is probably that the idea of an unequal division of units inside a month would have seemed a complete absurdity—much as if somebody today should suggest dividing a linear foot into $12\frac{1}{2}$ inches.

The historical process by which the Babylonian week became wedded to the Egyptian month, centuries after Julius Caesar had adapted the

Egyptian calendar to the needs of the Roman Empire, is an example of those accidents of human development which are as illogical as the buttons on a man's sleeves. Out of this mismating have developed some of the most annoying and troublesome inefficiencies of our present calendar.

With the great developments of the past generation in economic and commercial fields, it is not surprising that these calendar inefficiencies are being attacked. Ours is a time of change and rapid transformation. Efficiency is a keynote which is mothered by necessity. If an old machine does not produce as well as a new one, then the old must go, regardless of sentiment. What was yesterday an innovation is tomorrow a necessity.

It goes without saying that there will be some expense and inconvenience to installing any new system which is designed to remedy the defects of our present calendar. Perhaps even a period of confusion. But what at the outset may appear insurmountable difficulties will melt away as we become accustomed to a new order.

For years the nations of the world hesitated about adopting Standard Time, fearing the confusion which it might bring. But when it was adopted, only a few weeks passed before everyone had become adjusted and reconciled to the new system. Today and forever we shall reap the benefits of the initiative displayed by the small band of crusaders who secured the adoption of that reform.

So, too, I think it will be with the calendar.

APOSTLE OF SIMPLIFICATION

ONLY a month before his death Melvil Dewey joined The World Calendar Association, sending in his application for membership from his home in Lake Placid, Florida, where he died on December 26, at the age of 80 well-lived years. He was an unusual man, with a variety of talents and interests which enriched his thoughts and life.

The two Lake Placid Clubs owe their beginning and success to his vision and zeal, idealism and practicality—one located in the North for the enjoyment of winter sports and summer coolness, the other in the South for sunshine and warmth. Many Americans hold him in affectionate regard as the founder of these remarkable resorts.

He was an ardent disciple of simplification in all things—the inventor of the library decimal classification system, and the foremost American advocate of simplified spelling and of the metric system.

Naturally he sought to interest his friends and associates also in calendar simplification. Although he had committed himself to active support of the 13-month calendar plan several years before the alternative 12-month revision had been presented to the American public, he had not closed his mind, and he followed with keen interest the campaign of The World Calendar Association from its inception. On his membership card he made the following comment, in the striking simplified spelling which he advocated:

"I hav red with great interest yur Journal. Miss Achelis has dun valiant work of which I am proud & has pusht her plan ahed of 198 out of 200. I hav from the 1st been loyal to the 13 month skeme but hav an open mind & wil be glad to put the JOURNAL in our librari wher our members can get yur syd of the question."

GERMAN HISTORICAL STUDIES

By PROFESSOR ERICH PRZYBRYLLOK

(Abstracted from the German by Joseph P. Bowles)

Interest in calendar reform throughout Germany has become so widespread during the past few months that there has been a considerable sale for a book giving a popularly presented study of the calendar, its past, present and future. The author of this book is an astronomer of Königsberg, Prussia, and the publishers are Hinrichs of Leipzig. The following paragraphs are summarized from a long and scholarly chapter on New Calendar Reform.

HISTORICAL study of efforts toward calendar reform in the past have one very significant lesson for the present. They point clearly to the fact that under modern conditions any proposal for successful reform has a better chance the less change it proposes.

The Gregorian reform was comparatively simple, but it was two centuries in gaining general acceptance.

After the inauguration of the Gregorian calendar, the next attempt at reform took place in France in 1793, four years after the French Revolution. Its failure is an important signboard, pointing at the direction a successful reform will have to take, and the dangers of trying too much of a change.

The motive for the French Revolutionary Calendar lay in the exaggerated spirit of reform, common to all revolutions. Combined with this was the hostile enlistment of the revolutionary government against the church, and also a wish to impose the decimal system upon time reckoning.

The decimal system was the inspiration for the week of ten days, three of which made up a month of 30 days. Twelve 30-day months constituted a year, which was reconciled to the solar year by the addition of five (in Leap Year six) supplementary days, called *Les Sansculottides*. The calendar was a true repetition of ancient Egyptian and Roman models.

But it lasted only a few years. Its doom was sealed by the general public disapproval of the ten-day week, and the obvious deduction is that the seven-day week, consisting of six work days and one day of rest, is the division best suited to the rhythm of our lives physiologically and psychologically. The seven-day week, we may assume with a certain degree of assurance, is the "last word" on the question of a correct spacing of a day of rest.

Just as the French Revolution tried to drop the seven-day week, so the French philosopher Comte later proposed to drop the idea of 12 months. He proposed division of the year into 13 months, each month consisting of four weeks of 28 days. The simplicity and clarity of the resultant calen-

dar is striking, but the division of the year into convenient quarters is abandoned, and there is no compensating subdivision possible, for the number 13 is a prime number and therefore has no other divisor than one and itself.

This proposal seems to have found a following particularly in the United States, where an active "American Equal Month Calendar Association" was organized many years ago in Minneapolis for promoting the so-called "Liberty Calendar," which proposed to add a month called "Liberty" between February and March.

There have been many other fantastic proposals for reform. The so-called Ostwald scheme would abandon all reckoning by months and would number the days serially from the beginning of the year. April 10 would be known as the 100th day; July 19 would be the 200th day; and October 27 would become merely the 300th day.

Another numbering proposition divides the year into four quarters and numbers the days inside each quarter. The days progress from 1 to 91, with months omitted. July 13, for example, becomes III-13, and November 2 becomes IV-33.

A third suggestion for a purely numerical calendar uses weeks as the principal units of reckoning, and its advocates recommend numbering the weeks from 1 to 52.

These numbering systems, however, are completely impractical. The majority of mankind, given the date "220", would not be able to make any sort of association with the prevailing seasonal temperature, while the corresponding designation "August 8" suggests warm summer weather. Even a numbering system which tags the weeks from 1 to 52 uses a series too large to facilitate a survey of the whole year.

Practical calendar reform, in fact, must stand on the principle of reforming the calendar with the least possible change. And this is the basis on which proposals have been made by Hanin, Rosenkranz, Busching, Koppen, Grosclaude, Des Saussure, Philip, Clifford, Blochman, and others. According to these proposals, the 52 weeks and the 12 months are preserved, as well as the convenient division of the year into four quarters. The calendar is made "perpetual" by leaving one certain day of the year without a weekday name, Leap Day being similarly treated at four-year intervals.

All these proposals are agreed that each quarter consist of one month of 31 days and two months of 30 days each. The pattern of the weeks and months is repeated exactly within each quarter. If one starts the year on Sunday, then Sunday is fixed permanently as January 1, and if one gives the first month of each quarter 31 days, then each month contains 26 working days. It remains only to insert a day apart from weekday designation at some place. If one assigns the last day of the year for this pur-

pose, then it is suitable to insert Leap Day at the end of June, between June 30 and July 1.

By and large the calendar with 13 months offers great advantages for anyone who uses the month solely as the basis for his management and accounting. But in all other respects the calendar with 12 months is superior, especially as it is far less disturbing to the established order of things. A thorough canvass of the governments of various countries has revealed definitely that there is more sentiment in favor of retaining the existing number of months.

The agitation and studies which have been undertaken during the past few years certainly show that there is a rapidly increasing interest in calendar reform in many countries. Public opinion, however, is not yet fully informed or universally aroused.

Actual change in the calendar cannot count on success until there is a broader public demand for it. In every country there is need for fuller information and completer knowledge of the arguments for and against the suggested plans.

There is even need for education regarding the faults and defects of the present calendar, which are by no means universally recognized. These faults have to do not merely with the annoying variations in lengths of months, quarters and half-years, but also the disadvantage of a calendar which is not "perpetual", that is, one in which weekdays do not coincide with days of the month, the weekday falling behind one day each year, or after a Leap Year, two days. This is plainly troublesome in counting past the end of a calendar year. It is a real problem in mathematics to identify a weekday with a given date one or more years ahead or behind, and most people are helpless in dealing with such a problem.

Furthermore, it is conspicuously unfortunate that certain feastdays, such as Christmas and New Year, should fall on changing weekdays. The movability of Easter is still more annoying, for this holiday wanders from March 22 to April 25, having a variability of 35 days. The disadvantage of this movability is felt by a wide circle of the population, particularly in European countries where Easter is a starting point for a great variety of human activities. Fixation of Easter would be a tremendous convenience to millions of people, and this fact has been recognized by many official bodies at intervals during the past thirty years. The German Reichstag discussed the subject in 1909, and the Hansabund has been on record as favoring a fixed Easter, since 1910.

Some people have held that fixation of Easter might well be taken up apart from the general question of calendar reform. However, if this were done, and Easter was placed definitely on a certain Sunday in April, without waiting for the adoption of a perpetual calendar, its date would still "wander" within a range of seven days.

YEAR DAY AND LEAP DAY

By COLONEL ERNEST McCULLOUGH

At the time of his death on October 1, 1931, Colonel McCullough was engaged in writing a number of articles on Calendar Reform, which he had expected eventually to combine into a book on the whole subject. He was one of the earliest advocates in America of calendar reform, and readers of the JOURNAL will recall the very interesting article which he contributed to the issue of June, 1931. His versatility as an author is evidenced by the list of his 16 books, ranging from subjects of general interest to intricate textbooks on engineering. His latest book, a popular guide to household finance, was placed on sale only a few weeks before his death. He had hoped to complete his book on calendar reform for publication this spring. The following article is one of the completed chapters.

CONTROVERSIALISTS continue to find food for argument in the proposed introduction of "Year Day" and "Leap Day" into the revised calendar. These devices for "intercalary days," which are necessary in order to bring about a perpetual calendar, are attacked by certain religious groups on the ground that they disturb the ordered sequence of the seventh day.

I desire, however, to call attention to the fact that the proposed "World Calendar" actually meets this situation in an ingenious and wholly adequate manner. It divides the year into quarters, each of which contains 91 days or 13 weeks. Each month has 26 secular days, and the 365th day of each year becomes one-half of a double day. It is this device and this terminology which provides the most satisfactory solution of objections raised to calendar reform on religious grounds.

For, under The World Calendar, December 30th will be Saturday and will contain 48 hours. June 30th in ordinary years will contain 24 hours and in leap years will contain 48 hours. There is biblical authority for this nomenclature, for in ancient times the Jews had Sabbaths 48 hours long occurring cyclically in order to adjust their religiously founded year of seven-day weeks to the astronomical year.

The intercalary days, as treated in The World Calendar, give believers in the holiness of the seventh day and in the invariable sequence of the seven-day week, two additional periods for religious observance. Those who do not wish to have a dated double day are privileged to recognize the latter half of it as a separate day and give to it a name should they so desire, as an extra Saturday. (In The World Calendar these days are tabulated December Y and June L respectively.)

Throughout human history it has been the habit of wise men to adapt well-established ideas and habits to newer ideas. In this manner has come

about the adoption in newer religions of many beliefs and customs that people had attached to older religions. In time, these adopted and adapted concepts have become a firm part of the newer, now an old, religion.

Not only in religion but in many other departments of human life a weaving of all that is desirable—or at least not objectionable—of the old into the newer way, has brought about the greatest change with the least friction. Burke, in his great speech on the conciliation of America, said: "All government—indeed every human benefit and enjoyment, every virtue and every prudent act—is founded on compromise and barter." His words are true in connection with the great subject of calendar reform.

The World Calendar is obviously the best compromise that has yet been suggested for correcting the discrepancies of the Gregorian system without doing undue violence to long-settled habits and customs. It contains all the advantages that have been urged in favor of any revision, and at the same time it shows a sympathetic regard for such resistance to calendar reform as is based solely upon religious belief and dogma. It effectively disposes of the main difficulty that has hitherto loomed large in all discussion of calendar reform, namely the reconciliation of intercalary days with belief in invariability of the week of seven days.

It is obviously wise to effect the necessary reforms in the calendar with as little violence to religious belief as possible. It is equally necessary that the reform shall provide the accuracy of a perpetual calendar keyed precisely to the immutable laws of astronomy. The movements of the celestial bodies are governed by majestic and unalterable cycles which do not perfectly serve man as units for the measure of time. Man's needs take in the day, week, month, season and year; astronomical periods cover centuries and when divided into man's years there are surplus hours, minutes and seconds to interfere with accurate and invariable arrangements of days, weeks and months. Man needs measures of time that may be correlated to his units of measure of length and volume, that are easily adaptable to his puny needs. The whirling stars in their courses baffle the exactness he seeks, and he must perforce do the best thing possible through the exercise of compromise and the law of averages.

Having effected his compromise with the stars, he must now seek a similar reconciliation with his religious beliefs. The seven-day week was imposed on the calendar at a period long after the 12-month division had become an accepted fact. Common sense and racial traditions dictate that neither the seven-day week nor the 12-month year can be discarded with any hope of popular acceptance. The World Calendar therefore is the sanest of all proposals for calendar revision, because it retains both these traditional features of time measurement, and creates a perpetual calendar with all due deference to the sensibilities of religious believers. Scientists and students of human relations are firmly of the opinion

that tampering with the 12-month year is as impossible of acceptance as tampering with the seven-day week. The 12-month year, as arranged by the Egyptians, served the world longer than any other division. By this system the four well-defined seasons were tied into definite time divisions. The number 12 has been regarded from time immemorial as peculiarly suitable and convenient for calendar purposes. Its divisibility into halves, thirds, fourths and sixths has paid enormous dividends in efficiency, enabling the calendar to be used even by the most ignorant people with facility in its divisors and multipliers.

Calendar reformers must have this axiomatic fact clearly in mind: the inconveniences of the present Gregorian calendar do not arise because there are 12 months in the year, but are due solely to the inconsistent and illogical distribution of days in the month.

Aside from smoothing out these difficulties, the most important change is that which makes the calendar perpetual. That is, a revision whereby the calendar begins on a definite week-day each year, so that a calendar printed for one year suffices for all the years to follow. It is this second aim of calendar reform which meets with objection from certain religious groups, for this aim can only be accomplished by the introduction of intercalary days. When these are called "blank days," as they have been called by many proposers of calendar reform, they interfere with the seventh day that is the Sabbath, whether it be the Saturday Sabbath of the Jews and certain Christian sects, or the Sunday Sabbath of all other Christians. While liberal religionists find no serious objection to Year Day and Leap Day, the more strictly orthodox regard the succession of seventh days devoted to religious observance as something which has been preserved miraculously and therefore must not be altered by man-made calendars. The World Calendar meets this objection by discarding the terminology of "blank days" and treating the intercalated "Year Day" and "Leap Day" as second halves of a lengthened or 48-hour day.

An interesting suggestion regarding the arrangement of holidays in the new calendar comes to me from a correspondent in Bombay, who writes: "With The World Calendar, I believe each nation can group its holidays in such a way that they are celebrated, not only on Monday, but on the same Monday of each month. Saturday now is a half-day in many industries, and within a few years the 5-day working week will be common. By setting aside the first Monday in each month as a commemorative day, there will be 12 holidays a year, and each month will have one grouping of three rest-days, Saturday, Sunday and Monday. There being 26 weekdays in each month, the deduction of the monthly holiday leaves 25 days, a unit of astonishing convenience for many reckonings and simplification of accounts."

HOMAGE TO CAESAR

By WILLIAM B. PARMELEE

In the November issue of *Popular Astronomy*, published by the Goodsell Observatory of Carleton College at Northfield, Minn., the late Professor Parmelee summarized the reasons against a 13-month year, and urged the adoption of a revised 12-month equal-quarter calendar. In his text he outlined the plan known as the Grosclaude proposal, which is similar in general principles to *The World Calendar*, although differing in detail. The following extracts include the more general and popular portions of his interesting article, necessarily abbreviated for lack of space.

WE ARE still paying homage to Caesar. The calendar as we have it today has stood unchanged for over 175 years. It has faults, most of which are entirely unnecessary. Many schemes for its improvement have been suggested. Some propose a year of 13 months: shall the 12-month year which has been in efficient service for over 2600 years be discarded without care lest the remedy create more evils than cures?

The making of a satisfactory calendar is no easy task. The day, which is the most primitive and obvious unit of time, is not invariable in length. Owing to the ellipticity of its orbit, the earth travels faster in winter than in summer. The invariable speed of rotation about its axis, taken in connection with its variable speed of revolution in its orbit, brings the sun to the meridian a half hour earlier at one extreme than at the other. So noonmarks and sundials are in error by about 15 minutes at these times.

Almanacs indicate this by the expression "sun fast" and "sun slow." Clocks in order to keep steady hours must average the times of the sun's goings and comings, thus giving us what is called "mean sun time" and the day of 24 hours, which is the average length of the periods between successive transits of the same meridian by the sun throughout the year.

This average is taken as the standard day, and is the one always meant unless otherwise specified. The next most obvious unit of time must have been the period of the moon's recurrence to the same place, giving us the moonth or month. Later, as people dispersed further from the tropics, the changes of the seasons would be noticed. Thus the year was recognized.

All of these were astronomical periods, but unfortunately for the calendar maker they are mutually incommensurable, and to add to his difficulties only the year is of inflexible length. So he must adopt an inflexible artificial standard day to an inflexible astronomical year which can never be measured in terms of days exactly. Any attempt to bring

the moon's period into the scheme baffles him, for it cannot be measured in terms of days or years and furthermore is slowly changing.

The period from full moon to full moon is approximately 29.53 days, which cannot be fitted into either a 13-month year with 28-day months, or a 12-month year with 30- and 31-day months, but agreeing more nearly with the latter. So the moon must be ignored.

The remaining unit of time in common use—the week—is not an astronomical period at all. Its origin is doubtful. But it is so convenient and so thoroughly entrenched that no system of time reckoning can ignore it. However, it is not an aliquot part of the year or month, and so cannot be made to harmonize perfectly with either. Dates controlled by the moon must be found by calculation.

The principal defects of the present calendar are:

That no year is the duplicate of any other year except at irregular intervals sometimes six years apart and twice as often eleven years apart, thus making it practically impossible to memorize it, and necessitating the printing of calendars for each year at a cost of millions of dollars.

That the anniversary of an event seldom falls on the same day of the week as the event itself, but roams over the entire week. It will recur on the same day but eleven times in a century, and the day of a future event can be foretold only by a laborious process or by reference to carefully prepared schedules not often readily accessible.

That the year cannot be divided into equal halves, quarters, thirds, sixths or twelfths. There is no standard month, no standard quarter, no standard half-year. The month may comprise 28, 29, 30, or 31 days. It may have as few as 24 business days or as many as 27 without taking into account holidays, which of course vary in different months and different countries and cannot be considered in the making of a calendar.

Business transactions involving time units need standard units in order that the result of operations during one unit of time may be directly comparable with the output of any or all other such units without requiring corrections for the unequal times as at present. Our calendar in this respect is about as bad as possible. All anniversaries and fixed dates now sometimes fall on Sunday, occasioning their celebration in a manner offensive to many, or its change to another date. Legal and periodical dates cannot be set on a fixed date but resort must be had to circumlocutions.

All of these defects are unnecessary and easily avoidable. By an extremely simple method, suggested by several persons independently, which is in substantial accord with some eight other similar schemes that have been presented to the League of Nations, all of these objections are eliminated and no new ones introduced.

In the simplified 12-month calendar, every year is exactly like every

other year except for the extra day of leap year, which functions solely to enable the calendar to keep pace with the sun.

Notice that only three monthly schedules make a complete perpetual calendar. These schedules are very easily memorized. Printed calendars except for memoranda will become obsolete.

Notice that each month of the entire year has exactly 26 working days, giving business the standard month which it asks for. The 31-day months only have five Sundays. Each half year will be exactly like the other half no matter where the dividing line be drawn. Divide the year into quarters wherever you will, each will be exactly like every other one with the same number of working days and the same number of Sundays.

Notice that no historical date need be changed, as, e.g. was the case at the time of the last revision of the calendar in 1752 when Washington's birthday had to be shifted from February 11 to February 22. It can deviate from its strict anniversary no more than it does now.

Notice that recurring events, like elections, inaugurations, meetings and so forth can be given fixed dates without circumlocutions.

The old calendar will glide into the new without any shock to business, indeed with changes so slight as to be scarcely noticeable by anybody. The change would cause little if any more confusion than the recurrence of the 29th day of February. The 13-month calendar sacrifices everything to get 13 perfect months of exactly four perfect weeks. But does it get them? February is mutilated in America by two legal holidays; May, July, September, October, November and December by one each.

The 13-month calendar introduces a year that can be split only into the most unworkable fractions of thirteenths, and upsets every date in the calendar, except New Year's, not in an orderly uniform manner, but irregularly from one to 15 days forward and backward.

In Spanish-speaking countries the year is divided into "tercios" or thirds. These will be impossible as quarters without splitting months.

With the 13-month calendar in vogue, Lincoln's birthday will be shifted to February 13, Washington's to February 26, Memorial Day to June 11, and we shall buy fireworks to celebrate the glorious 18 of Sol!

By comparison, the simplified 12-month calendar proposes a standard business month of 26 working days, the year to comprise 12 such months, hence divisible into two, three, four or six equal parts, each part subdivisible and all making the most convenient and workable fractions possible. No calendar date will be shifted from its present position in the year more than the present calendar is shifted by reason of its unmanageable fraction of a day, which is necessary to complete a year, and the international date line (for though I am writing this on Monday, it is Tuesday over a large part of the world right now).

EXCERPTS AND REVIEWS

Psychological Aspects

By PROF. HOWARD C. WARREN
Princeton University

(Extract from article in *Scientific Monthly*,
November, 1931)

IN THE efforts made to reform our lopsided calendar, too little consideration has been given to the principles of psychology. The popular mind clings to tradition in the fundamentals of life, as shown in our persistent cleaving to our bewildering system of weights and measures, and the British adherence to their inconvenient monetary system. It often requires a cataclysm, like the French Revolution, to uproot these traditions.

An added difficulty arises in the case of calendar reform, due to religious doctrines and prejudices. In Christian, Jewish and Mohammedan countries the 7-day week, with its one day of rest, has been recognized from "time immemorial," and any attempted dislocation of this cycle inevitably meets violent opposition.

Taken on its merits alone, the 12-month year works better. But even aside from this, it is preferable for psychological reasons. The community at large looks askance at a new month, as it does at a milligram and a kilometer. It will take an immense amount of pamphleteering to reconcile the public to such a drastic innovation. On the other hand, a mere rearrangement of length in the existing months should meet with comparatively little opposition, when the many advantages of this evening-up are pointed out.

The main obstacle to calendar reform comes from the 365th day, which throws the weekly sequence out of gear. Either one must begin each successive year on a new day, or else one must somehow "take a day off" every year—and two days off every fourth year. Here the reformer runs up against an even more powerful psychological factor: there is not merely passive inertia but active opposition to the proposed change. If the 7-day week has been divinely ordained, what is man that he should dare disturb the sacred cycle?

The force of this objection, as a factor of folk and religious psychology, has undoubtedly been underestimated by the cal-

endar reformers. The church—whether Christian, Jewish, or Mohammedan—is a powerful institution in our present-day civilization, and unless its influence can be enlisted in behalf of the movement, the reform has little chance of success.

What antagonizes especially the religious sense of the community is the idea of a "day without a name"—a *blank* day inserted, say, between Saturday and Sunday, which lengthens one week every year to an 8-day cycle. Does not this fly in the face of divine ordinance as well as of age-long custom? Is there any possible way of getting around this impasse?

It is one thing to excite attention—quite another thing to induce acceptance; for attention may produce opposition instead of conviction. Unless the arguments for reform are so powerful as to sweep aside opposition, the movement is bound to fail.

The psychologist would urge the reformers, first of all, to present a united front. An equally important step is to enlist the active support of ecclesiastical authorities in the leading religions, for their influence counts more than any other single factor. The industrial and financial leaders too must be enlisted—not merely as supporters but as active workers. And our educational leaders should be brought into the fold—for what school or university is not vexed by the wanderings of the academic year?

The ecclesiastical authorities will be hardest to reach. It is true that the present calendar bears the name of a distinguished pontiff. But his reform involved only a slight dislocation of the Julian calendar. The church will not readily accept a change which involves altering many feast-days, fasts and saints-days. The tremendous value of the new system must be made clear beyond peradventure.

It is not sufficient to agitate for reform. The appeal must be made to this, that and the other individual and class of society. There are abundant arguments for calendar reform, one or another of which should strike home to almost every group in the community. The best strategy is to attack each group or class with those particular aspects of reform which will affect and improve their own situation.

JOURNAL OF CALENDAR REFORM

EDITORS

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CARL LIDDLE

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AT GENEVA consideration of calendar reform has made formal progress through the routine channels of the League of Nations during the past three months. On January 18 the Council of the League received, through the representative of Poland, Mr. Zaleski, the official report of the October conference on Calendar Reform, called by the League's Commission on Communications and Transit. The Council's attention was called to the fact that "this was the first time that a conference of government representatives had been called upon to exchange views on questions concerning the measurement of time and the organization of economic and social life in relation to the calendar."

Mr. Zaleski pointed out that "as regards Easter stabilization, the almost complete unanimity of opinion among the delegations present was most impressive." The number of governments which were represented at the Conference was given by Mr. Zaleski as 44, among them being several states which are not members of the League, such as the United States, Egypt and Turkey.

In regard to the Easter Act passed by the October Conference, the League Council voted "to bring to the notice of the religious authorities concerned" this decision regarding the economic and social aspects of fixing movable feasts, expressing the hope "that they will consider in the most favorable spirit what action they may take in the matter." Formal notification will not be sent to the churches, however, until after May 1, the interval providing time for additional governments to subscribe to the Act if they so desire.

With reference to general calendar revision, the League Council took no action except to "express its satisfaction at the success achieved by the Conference." The text of the report submitted to the Council and the resolutions adopted, have been mimeographed for distribution by the League and may be obtained from Geneva on request. In general, however, Mr. Zaleski's report follows closely the lines of the "Survey" passed by the October Conference and printed textually in the December issue of the JOURNAL.

FROM THE MAILBAG

The Journal of Calendar Reform is worthy of wide reading. I congratulate you on its excellent set-up and material.—DUNCAN G. MACLENNAN, Clergyman, South Pasadena, Calif.

I am in favor of a calendar reform, and believe that from an economic standpoint such revision is inevitable.—ELMER W. LIEBSCH, Chemical Engineer, Salem, Mass.

No remarks necessary. I'm in favor of it.—WILLIAM A. DRUMB, Publisher, Wisconsin Dells, Wis.

If reform is desirable, the less radical and more natural change to a modified 12-month calendar seems preferable to the drastic 13-month system. I favor a fixed date for Easter.—FRANK M. FIELD, Clergyman, Flint, Mich.

I shall take pleasure in placing The Journal of Calendar Reform in our general reading room, where it will be accessible to the public.—L. HELEN BERKEY, Librarian, Johnstown, Pa.

Very interesting subject, and I am pleased to become identified with the movement.—A. F. ROSENHEIM, Architect, Los Angeles, Calif.

In a house magazine mailed monthly to 1,200 business executives in Denver, I am favoring editorially The World Calendar.—H. W. CLARK, Editor, Denver, Colo.

I heartily approve of this proposed new calendar. It should unify, solidify and simplify fiscal affairs of all government bodies—local, state and national—and save us at the same time all that was sacred and personal in the old calendar.—PAUL M. LEHMAN, Methodist Episcopal Minister, Washington, D. C.

The World Calendar is certainly worthy of serious consideration. I do not see how it can be improved upon.—MISS F. M. FEWELL, Secretary, Chamber of Commerce, Rock Hill, S. C.

The Journal I received is fine. I shall use it in speaking to others about the work.—V. J. TINGLER, Clergyman, Sandusky, Ohio.

The World Calendar plan seems to be comprehensive, yet, far from extravagant. I am for it.—FRANK R. TABER, JR., Journalist, East Aurora, N. Y.

I have carefully considered both the 13-month proposal and also your revised 12-month plan. I think yours is the most feasible and will not be too radical a change.—HORACE BATCHELOR, Presbyterian Clergyman, Mattoon, Ill.

Splendid idea. Hope it will be adopted.—LOUIS E. REICHHOLD, Editor, Brooklyn, N. Y.

Your calendar seems the most rational yet offered. I do not favor a change from a 12-month year.—THEODORE REED KENDALL, Editor, New York City.

I am heartily in favor of calendar revision. And the 12-month World Calendar, as it is proposed, seems to be the most desirable.—J. M. RASNAKE, Minister, Atlanta, Ga.

If the calendar must be changed, The World Calendar appeals to me as the best and most logical of any plan presented thus far.—J. H. PINKSTONE, Editor, Wauseon, Ohio.

The revised 12-month calendar seems to be the best solution of the calendar problem. I am in favor of it.—H. W. HARMON, Teacher, Grove City, Pa.

I am heartily in favor of the proposed changes offered by The World Calendar Association, and shall be glad to read any publications on the subject.—S. R. BRIDENBAUGH, Minister, Reading, Pa.

Believe you have a worth-while calendar to consider, if a change is to be made. I like your plan much better than the 13-month proposed one.—L. E. BROWN, Editor, St. Paris, Ohio.

Your 12-month calendar appeals to one as the best solution of the calendar muddle—involving the least possible friction and least radical changes.—W. W. MACHENRY, Minister, Centralia, Wash.

Think your plan the best brought forward as yet.—W. H. MANAGAN, Lumberman, Lake Charles, La.

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